

THE LEISURE HOUR

A FAMILY JOURNAL OF INSTRUCTION AND RECREATION.

"BEHOLD IN THESE WHAT LEISURE HOURS DEMAND,—AMUSEMENT AND TRUTH KNOWLEDGE HAND IN HAND."—*Cowper.*



COLONEL GIFFARD AND LORD AUBREY RESCUE TWO CAPTIVES.

THE DOONES OF EXMOOR.

CHAPTER I.

ON a lovely evening in the autumn of 1641, two horsemen, well mounted and equipped, rode leisurely along a beaten track on the wilds of Exmoor. Their route lay northward, over the gorse-clad hills, from whose swampy sides the Barle and the Exe stole forth in tiny rivulets, filtering from bogs of considerable extent, and dangerous withal to travellers unacquainted with the locality.

"We must ride here single file, my lord," said the older of the two; "so, like a bell-wether I'll take the

lead, and be answerable for your safe appearance at the hunt to-morrow, if you follow my steps; for, should your palfrey set foot on the borders of Mole's Chamber, there would be as speedy a termination to your history as there was to the career of the yeoman whose sad fate originated its name."

His companion accordingly reined back, remarking, as he followed his guide, "I've no fancy, Giffard, I assure you, for being embalmed in a peat coffin, and turning up some day to make the fortune of a Devonshire showman. Have people really lost their lives hereabouts?"

"One of our north country farmers," replied Giffard, "lies buried just here to the right. He disappeared from his brother huntmen, as the tale goes, in an instant, and I believe the bog is deep enough to hold a good half dozen on the top of each other, without trace or sign that they had ever been. His name was Mole, and the bog is called Mole's Chamber to this day."

"An apartment," said the other, "which I beg you to shun with all circumspection; and my advice is, that we prick forward, and gain more certain paths before nightfall. Such a desolate region, I warrant you, all England besides is not able to show."

"And since the country has become so haunted with the spirit of civil strife," replied Giffard, "these lonely hill ranges have been more formidable than ever to travellers; for, let them escape the swamps as they may, it's ten to one if they escape the Doones of Badgeworthy."

"Doones, Colonel?"

"Freebooters, my lord; a gang of desperate marauders, who have their stronghold in a dell a few miles to the left. There are men of noble blood amongst them, they say, and a more daring set of fellows never levied black mail, or rifled a homestead."

"Lawless times make lawless men," responded his companion; "but the nature of the country is enough to tempt such characters into existence. One might as well think of denying the doctrine of non-resistance as of picturing Exmoor destitute of moss-troopers."

"Marry, you're right, my lord. Old Faggus was the hero of the heath for many a long day; but he was a heart of wax compared with these gentlemen, who are more disposed than he to prove the freedom of their wills by arguments of metal."

"Old Faggus, say you, Colonel? What of him?"

"A bold highwayman, my lord, who scoured these wastes on a steed as famous for his fleetness and sagacity, as his master was for a remarkable combination of audacity and benevolence. He did the knave good service in many a hard pinch, and carried him safely through such dangers imminent, that he was called 'The enchanted Strawberry Horse.'"

"You stir my curiosity, Colonel," said the younger cavalier. "Let me hear some of his doings, I prithee. It will help to beguile the time until we are quit of these quagmires, and have turned our backs on as dreary a wilderness as ever made men creep all over by its solemn solitude."

"As you please, my lord. 'Twill help us, as you say, to forget the loneliness of the place, and excite our admiration of qualities which might have been turned to better account. A few miles hence lies the village of Simonsbath, where the first pack of staghounds was kept three quarters of a century ago, by the ranger of Queen Elizabeth, of glorious memory, her Majesty being 'well and most excellently disposed to hunting.' In this village the redoubtable Faggus was wont to regale himself at the 'Exmoor Arms,' where he passed for a country gentleman; but, mine host having knowledge of him, contrived his capture by four stout fellows, who led him forth in triumph as their prisoner. At the sound of his well-known whistle, however, his faithful nag burst open the stable door, and, seeing the state of affairs, rushed on his master's captors. They released their prize in a twinkling; and then, with a joyous neigh, he carried off the freebooter, who was out of sight before the tapster had time to bethink himself."

"Was that instinct or reason, Giffard?"

"Nay, my lord, I've no dealings with such subtleties, but I dare to say 'twas affection and courage; and the same good qualities were shown on Barnstaple Bridge,

when Faggus was fairly hemmed in by armed men, who pressed on him from either end, so that escape seemed impossible. But a word to his trusty 'Strawberry' was enough. The noble creature, clearing the parapet at a bound, leaped into the tide and swam away with his loved burden, to the no small astonishment and chagrin of the robber's pursuers."

"One can hardly credit it, Giffard," said his lordship. "The fellow must surely have had some commendable points about him, to gain such love and fidelity from the animal, who was worth a king's ransom."

"So rumour says, my lord. He was kind to the poor, and would ride miles to befriend the afflicted. It was his good nature that helped him to Tyburn at last."

"How so, Colonel?"

"Why, in this wise. An officer disguised himself as a mendicant, and implored alms from him as he sat in the settle of a country inn; and whilst Faggus was routing his pockets, the wily suppliant slipped a rope around him, and at the same moment poor 'Strawberry,' the enchanted horse, was shot in the stable by an accomplice."

"And so they hanged him, Giffard? A fitting end, too, after all. I suspect he was a degenerate Roundhead, who had just enough conscience left him to make him charitable. But let your tongue rest awhile, that your ears may be diligent, for the breeze brings ever and anon with it what seems to me the trampling of horses' feet. There!"

"I hear it, my lord; it comes from the west. There is more than one of them, and they ride briskly. Be they friends or foes, we but round this hill to spy them."

And no sooner did the open country break on their view than they beheld two horsemen, sweeping along at a brisk gallop.

"In troth, Colonel," remarked his lordship, smiling, "your yeomen carry their dames in loving fashion. They might surely be satisfied with the pillion, instead of perching them on their holsters as though they feared—"

"Our yeomen have no such practice," said Giffard, scarcely knowing what to say, so astonished was he at observing that each of the horsemen carried a woman before him. "I suspect," he added, "we have fallen on a couple of Doones, who are bearing live spoil to the warren, for which a fine ransom will be demanded. Let us look to our priming, my lord, and make up to them at our best pace."

Putting spurs to their horses, they dashed over the moor at a speed which soon brought them within hail of the brigands, who pulled up, and without staying to parley fired their pistols, though without effect. Fearing to return their fire on account of the ladies, the two cavaliers pushed forward to encounter the robbers hand to hand; and, anticipating this, the Doones disburdened themselves of their fair prizes, that they might fight at no disadvantage. The movement lost time, however, and Giffard, benefiting by the opportunity, closed up and wounded one of them so severely, that he fell from his horse, which bounded off like a frightened deer. His comrade was not so easily disposed of; for, though the younger traveller had attempted the same feat as the Colonel, the freebooter was too quick for him, and, knocking up his arm, drew the trigger of a second pistol, which fortunately flashed in the pan. In an instant the sword of the disappointed Doone flew from its scabbard; but, perceiving that he had now to contend with two, he delivered a parting blow, which was parried with difficulty, and, putting spurs to his horse at the same moment, rode off rapidly, exclaiming, "I know you, Auberley; we'll have a reckoning for this another day."

"Let him go," said Giffard; "he'll meet with his deserts soon enough, and we must needs look after the women. Gentle or simple, they claim our protection, and we'll leave the Doones themselves to take care of the knave who lies stretched there on the heath."

The women stood clinging to each other in mute terror, and were scarcely able to answer their preservers, when kindly questioned on the subject of their capture. Exhausted, pale, and trembling, they seemed incapable of thought or speech; but, discovering that they had fallen into the hands of friends, they soon became sufficiently assured to relate, that having been gathering wild flowers on the border of the moor, not far from home, they had been seized and carried off by two Badgeworthy highwaymen.

As there was no time to be lost—for the evening was now closing in—the ladies were quickly mounted behind the cavaliers who had come so opportunely to the rescue, and who again proceeded on their way across the wild.

"May we know," said Auberley, addressing himself to the maiden whom he carried with him on his palfrey—whose countenance, despite the lingering traces of terror and anguish, struck him as strikingly beautiful—"whom we have had the happiness and honour of delivering from the hands of those marauders?"

"I am the daughter of Sir Edward de Wichehalse," she replied, "and the other gentleman carries my maid, whose life I value almost as much as my own. We have to thank you, sirs, as well as a gracious Providence, for our escape from such desperate men, and must beg you to speed forward lest we should be overtaken by the rest of the band."

They hastened on accordingly, as smartly as was compatible with comfort, and soon came upon the cultivated country, which extended from the moor to the sea, within sight of a range of hills exceedingly grand and picturesque.

"That is my home," said the lady, pointing to a mansion but dimly visible in the gloaming: it nestled amidst fine trees on a slope protected by an elevated tongue of land forming a promontory, and commanded a side view of Lee Bay. "With your permission," she added, "we will now alight, and take the tidings of your gallant conduct to my father, who will be overwhelmed with gratitude to his daughter's deliverers."

"Nay, fair lady," replied Giffard, "you must forgive us if we spoil our manners by pursuing our journey, when we have seen you safe beyond the porter's lodge. We spend the night at Countesbury with my friend Bassett, to be ready for the morrow's hunt, and have already received more thanks than we deserve. To have rescued De Wichehalse's only daughter is more than a recompense for so small a skirmish."

The shades of evening had now stolen down on our travellers, and, to make up for lost time, they spurred quickly along the eastward road, which led to their destination. Each busied himself with his own thoughts, until the steep ascent to the crown of the hill on which their friend's villa stood caused them to draw rein, when Auberley broke the silence and remarked—

"A fine young lady, Giffard. You seem to know her."

"Ay," answered the Colonel, called back from a reverie on quite a different subject, "and as good as she's beautiful, though a little tainted with Puritanism. Her father was always inclined that way, and has brought her up in the faith of his ancestors, as he says, but which, according to our way of thinking, smacks of heresy. But here we are at the outer gate."

Sir Edward de Wichehalse was descended from a noble family of Holland, who left their native country in

1570, to escape the cruelties of the Duke of Alva, a relentless persecutor of Protestants. That bigoted, designing sovereign, Philip II, had determined to sweep the doctrines of the Reformation entirely from the Low Countries, and so zealously was his mandate obeyed, that "blood flowed like water, and the scaffolds were crowded with victims," amongst whom were many of Holland's most eminent merchants, statesmen, and nobles. The whole country endured a great fight of affliction, and a multitude whose number it is impossible to estimate were called to augment the glorious army of martyrs, to whom in all ages the word of God was dearer than life itself. A considerable portion of the population dispersed themselves through France and Germany, many of them finding an asylum in England, into which, being kindly received by Queen Elizabeth, they carried those arts and habits which had raised the Flemings high among commercial nations, and which at once incorporated them with the genial civilization of our beloved country.

Amongst the refugees who sought a home in Great Britain was the family of De Wichehalse, a wealthy nobleman, who by his devotedness to the Reformed faith had rendered himself peculiarly obnoxious to the Duke of Alva. Having secured the greater part of his fortune, he embarked with his wife and children in a small trading vessel bound for Bristol, and being struck, in passing up the channel, with the beauty of the north Devon coast, he built himself a dwelling not far from "the valley of rocks," and close to one of the arms of land that form Lee Bay. His eldest son became one of the most renowned barons of the west, distinguished, as were all his descendants, for those high christian qualities which make Protestantism a marked and influential reality; but the family history seems to have died out with Sir Edward and his daughter Jennifried, who, at the time our story commences, were the sole representatives in the country of their ancient house.

The young lady had but a slight remembrance of her mother, who died when she was three years old, in the act of praying for and blessing her; and, being an only child, the worthy baronet devoted himself to her education, with a hopeful earnestness which anticipated the time when, to the attentions of a loving child, she might add the helpfulness and solace of a christian companion. In this he was aided by a young person of sterling character—who remained with her as *femme de chambre*, when she had outgrown the nursery and the school-room—the attendant who had been borne off by the Doones as well as herself, and rescued in the way we have related.

Not only was Jennifried adorned by nature with personal attractions of no ordinary kind, but gifted also with considerable mental acuteness, which enabled her to pursue with interest and ardour the various classes of study in which her erudite parent himself delighted. She displayed a thoughtfulness and maturity of character beyond her years, and was no novice, either in the knowledge or experience of true religion. The word of God had been her chief lesson-book in things spiritual, and she had grown up a simple-minded, simple-hearted Christian, the joy of her widowed parent, who was himself a devoted man of God. No wonder that he often gazed on her with mingled feelings of pleasure and concern; pleasure, that she was all he had hoped for, and concern, lest the influence of the world, and the compromising spirit of mere religious profession she would be sure to meet with in society, might blunt the edge of her devotion, and beguile her from the straight path of christian consistency.

Such was Jennified de Wichehalse in 1641, her twenty-first birthday having been celebrated in the summer of that year; and if her father clasped her to his bosom with a warmth of affection which spoke in tears rather than in words, when he heard the recital of her capture and deliverance, it was but the natural expression of an idolizing heart.

"Colonel Giffard, did you say, Jennie?" he observed. "Are you sure it was he?"

"So Janet says," replied the daughter. "She has often seen him in Barnstaple, and the Doone who escaped addressed the younger cavalier by the name of Auberley."

"Auberley? Lord Auberley, no doubt, who is passionately fond of the chase. He is a youthful nobleman who has much of King Charles's favour, and is ardently devoted to the royal cause. He is said to be ambitious, and Fortune often sells herself at a dear rate to those who seek after her in courts."

"Rumour exaggerates, dear father," said Miss Wichehalse. "He may be an excellent gentleman, notwithstanding his desire, like Raleigh, to climb. At any rate, I owe him a debt of gratitude which I am sure you will endeavour to pay for me as opportunity serves."

"Even so, Jennie; I feel the obligation so deeply that I will endeavour to see him on the morrow, and give expression to it, as is most becoming."

THE HARVEST MOON.

EVERY one is familiar with the general facts relating to the harvest moon. In some parts of the country it is said in popular rhyme that "The Michaelmas moon nine nights rises soon." Long before astronomers wrote on the subject, farmers and labourers used to observe the early rising of the full moon in the beginning of autumn, and they called it "The Harvest Moon," from its usefulness in assisting them to gather in the fruits of the earth. The peculiarity at this season is, that the moon rises before or very soon after sunset for several evenings together, and that the interval between the time of rising on successive nights is less than at other times of the year. These results are produced by astronomical arrangements, the principles of which will be readily understood. The plane of the equinoctial is at right angles to the earth's axis, and as the earth turns round its axis, all parts of the equinoctial make equal angles with the horizon, both at rising and setting, so that equal portions of it always rise or set in equal times. The moon in her orbit seems to move at the rate of 12 degrees 11 minutes of space from the sun every day; and 12 degrees 11 minutes of the equinoctial rise or set in fifty minutes of time in all latitudes. If the moon's motion were equable, and in the equinoctial, she would regularly rise and set fifty minutes later every day than on the day preceding. This is the case at places on the equator. But the moon's motion is not on the equinoctial plane, but more near that of the ecliptic, which has a certain obliquity to the earth's axis. Owing to this obliquity, or slanting of the plane of the ecliptic, its different parts make very different angles with the horizon as they rise or set; that is, when they appear to view or disappear at any given place on either side of the equinoctial line. Those parts of the ecliptic, or signs of the zodiac with the smallest angle, set with the greatest, and *vice versa*. In equal times, whenever this angle is least, a greater portion of the ecliptic rises than when the angle is larger, as may be seen by elevating the pole of a globe to any considerable latitude, and then turning

its axis. Consequently, when the moon is in those signs which rise or set with the smallest angles, she rises or sets with the least difference of time; and with the greatest difference in those signs which rise or set with the greatest angles.

In northern latitudes the smallest angle made by the ecliptic and horizon is when Aries rises, at which time Libra sets; the greatest when Libra rises, at which time Aries sets. The ecliptic rises fastest about Aries and slowest about Libra. On the parallel of London, as much of the ecliptic rises about the adjoining signs, Pisces and Aries, in two hours, as the moon goes through in six days; and therefore, while the moon is in these signs she differs but two hours in rising for six days together; that is, about twenty minutes only, on the average, later every day or night than on the preceding. In fourteen days after, when the moon comes to the parts of the ecliptic known as Virgo and Libra, the opposite signs to Pisces and Aries, she differs almost four times as much in rising; namely, about one hour and a quarter later every day or night than on the preceding, while she is in these signs.

In October it will be observed that the moon also rises early, and with short intervals of difference on successive nights. The October moon is often called "The Hunter's Moon." These are the only two full moons in the year which can rise so near the time of sunset for a week together. The reason is, that the sun is in the signs Virgo and Libra in our autumnal months, and as the moon can never be full except when she is opposite the sun, she can only be full in the opposite signs, Pisces and Aries, in these two months.

As the moon is in Pisces and Aries during every one of her monthly revolutions, the question may occur, how is the remarkable rising at short intervals for successive nights only perceived at harvest? The reason is, that in winter these signs rise at noon, when the rising of the moon is neither regarded nor perceived. In spring these signs rise with the sun, because he is then in them; and, as the moon changes in them at that season of the year, she is quite invisible. In summer the signs of Pisces and Aries rise about midnight, and the sun being then three signs or a quarter of a circle before them, the moon is then in her third quarter; when, rising so late, and giving but very little light, her rising passes unobserved. But in autumn these signs, being opposite to the sun, rise when he sets, with the moon in opposition, or at the full, which makes her rising very conspicuous.

As there are many readers of "The Leisure Hour" on the other side of the world, it may be well to mention that, while in northern latitudes the autumnal full moons are in Pisces and Aries, and the vernal full moons in Virgo and Libra, it is just the reverse in southern latitudes, where the seasons are all contrary, as in Australia. There it is summer during our winter, and autumn during our spring. But Virgo and Libra rise at as small angles with the horizon in southern latitudes as Pisces and Aries do in northern; therefore the harvest moons are as regular on one side of the equator as on the other.

There is only one other point worthy of noting at present. The path of the moon is not exactly in the ecliptic, in which the sun always appears as if he moved. The moon's orbit is in a plane slightly oblique to the ecliptic, and intersecting it at two points called the moon's nodes. The obliqueness of the moon's orbit causes certain differences in the times of her rising and setting from what they would be if her path were in the ecliptic. There is a further difference caused by the shifting of the nodes,

which is always gradually taking place during a cycle of between eighteen and nineteen years. The result of this is, that the harvest moons are more conspicuous and more beneficial in certain years than in others. Those which occur when the moon is about her ascending node, or the point when she begins to ascend northward of the ecliptic, are the most favourable in northern latitudes. During the current cycle, the year 1857 presented the most striking appearance of the harvest moon.* The next year was nearly as remarkable, the phenomena afterwards gradually being less marked for several successive years, but always giving the benefit of the moon's rising nearer the time of sunset about the full in harvest, than when she is full at any other time of the year.

In the southern counties of England the crops are all off the ground before this time, and on that account the harvest moon is supposed by many to have been in August—a mistake to which some of the almanacks in common use have given additional currency. It must be remembered, however, that in the northern districts the harvest time is much later. The "harvest moon" is not determined by local circumstances or popular opinions, but by the astronomical facts already stated.

With the help of a globe, or of diagrams, the foregoing statements will be easily understood by those who are acquainted with the elements of astronomical science; but no previous knowledge is necessary to perceive the wisdom and goodness of the Divine arrangements in this matter, for the benefit of man. The course of the moon is so ordered as to bestow more or less light on all parts of the earth, as their several circumstances or seasons render it more or less serviceable. About the equator, where there is no variety of seasons, and the weather changes seldom, and at stated times, moonlight is not necessary for gathering in the produce of the ground; and there the moon rises about fifty minutes later every day or night than on the former. In considerable distances from the equator, where the weather and seasons are more uncertain, the autumnal full moon rises soon after sunset for several evenings together. At the polar circles, where the mild season is of very short duration, the autumnal full moon rises at sunset from the first to the third quarter. And at the poles, where the sun is for half a year absent, the winter full moons shine constantly, without setting, from the first to the third quarter. In our own latitude in summer the full moons are low, and their stay is short above the horizon, when the nights

are short, and we have least occasion for moonlight; in winter they go high, and stay long above the horizon when the nights are long, and we need the greatest quantity of moonlight.

From the other parts of the solar system the same idea of the Divine wisdom and beneficence is conveyed; and it may be presumed from analogy that the arrangements there are intended for the accommodation of the inhabitants of other worlds. Those of the planets which are farthest from the sun, and therefore enjoy least of his light, have that deficiency made up by several moons, which constantly accompany and revolve about them as our moon revolves about the earth. The remote Saturn has, over and above, a broad ring, which, like a lucid zone in the heavens, reflects the sun's light copiously on that planet; so that if the more distant planets have the sun's light fainter by day than we, they have an addition made to it morning and evening by one or more of their moons, and a greater quantity of light in the night-time.

Poets as well as astronomers have often made the Harvest Moon the theme of happy description, and generally in connection with the labours of husbandry, as when Thomson, the poet of the "Seasons," in the "Castle of Indolence" (Canto ii, Stanza 26,) is enumerating the farmer's joys in "Deva's vale:"—

"Witness, with Autumn charged, the nodding car
That homeward came beneath sweet evening's star,
Or of September-moons the radiance mild."

WEST OF KILLARNEY.

BY EDWIN DUNKIN, ESQ., F.R.A.S.

CHAPTER I.

THAT portion of the county of Kerry included within the barony of Iveragh, is undoubtedly one of the most interesting districts to be found in our sister isle. The boldness of its mountain ranges, the picturesqueness of its coast and headlands, and the wild and uncultivated appearance of its moorlands, combine to give abundant subjects for the admiration of all true lovers of natural scenery. To the tourist especially, who devotes his summer excursion to the south-west of Ireland, the aspect of this unfrequented spot, with its native wildness, will form a not unpleasant contrast to the luxuriant and enchanting neighbourhood of the far-famed Lakes of Killarney, with which, excepting in the height of its mountains, it has little in common.

The form of the ground in the baronies of Iveragh and Dunkerron, which includes the extensive promontory between Dingle Bay and Kenmare Bay, is chiefly mountainous, having almost every variety of shape, presenting high peaks and cliffs, narrow passes and glens, or lofty and sometimes rugged mountain chains, frequently indented by rocky coombs with precipitous sides, overlooking small tarns. Long open valleys which are to be found between these mountains, extend from the interior to the sea, containing in their lower parts, streams, lakes, or flat boggy keels, and generally terminating in bays, harbours, or sounds.

The mountains of the district may conveniently be arranged into four principal ridges. It is unnecessary, however, to state in detail the course which these ridges run, excepting, perhaps, that which passes through the immediate neighbourhood of the district which forms the subject of this paper. This extensive range of mountains runs along the south shore of Dingle Bay, from Rossbehy to Valencia, the highest peaks of which are at Drung Hill, and at Knocknadober, each being more than 2000 feet above the level of the sea. Doulus Head is the western extremity of the ridge on the main-

* For the sake of comparison with the times as seen in this year's almanack, and to show the phenomena in a year when they were more striking, we give the times of the harvest moon rising in 1858. In that year it was full moon on Thursday, the 23rd September, at twenty minutes past three in the morning. Now, mark the times of the moon's rising several days before and after the 23rd of the month. On the first day of that week, Sunday, the 19th, the sun set at London at four minutes after six. The moon had already been up for above an hour, the time of rising being two minutes after five (marked in the almanack 5h. 2m.). On the 20th, the time of rising was 5h. 15m.; on the 21st, 5h. 28m.; on the 22nd, 5h. 38m.; on the 23rd, 5h. 51m.; on the 24th, 6h. 4m.; on the 25th, 6h. 20m.; on the first day of the following week, the 26th, 6h. 42m. It thus appears that the moon rose before or very soon after sunset for several evenings together. What is more remarkable is the short interval between the times of rising on the successive evenings. During the whole week, from the 19th to the 25th, there was only about an hour and a quarter's difference in the time of rising. At some other seasons of the year there is greater difference in the time of rising in a single evening. For example, the last four days of April of that year. The full moon then was on the 28th. The moon rose on the 27th at 7h. 5m., and on the 30th at 10h. 47m. In four days there was a difference of three hours forty-two minutes. In seven days of September, from the 19th to the 25th inclusive, there was a difference of only one hour eighteen minutes. In the last quarter of the same moon, when unavailable for useful light, the time of rising on the 3rd of October was 1h. 15m. in the morning, and on the 6th, 5h. 21m., making a difference in only four days of four hours six minutes.

land, forming the entrance to Valencia Harbour. The mountains reappear in the island of Valencia, and terminate at Bray Head, a cliff of 588 feet in altitude.

The mountains which form the other ridges are equal in height to the above, and in some cases higher. But one of the most picturesque spots to be seen anywhere, is some miles to the south of Dingle Bay, and extends from Ballaghabeama Pass by Beown mountain to Finnavagoff, where it widens into an elevated plateau about 2000 feet high, and sends off the long spur which runs between the valleys of the Inny and Cummeragh rivers. The latter river passes through the lakes Derriana and Currane, the scenery of which is extremely beautiful. It also receives the drainage of several smaller lakes, some of which are celebrated for their natural beauty. The river Inny is separated from the Cummeragh by a small narrow ridge, the two rivers flowing side by side, at a distance of two miles, to Ballinskellig's Bay, into which they fall.

The valley of Glencarr is still more remarkable, being a deep irregular hollow, six or eight miles across, having wild and rugged hills on every side, being bounded in one direction by the celebrated Macgillycuddy's Reeks, the highest point of which, Carruntuohill, is 3414 feet. No pass for a road leads into it with a less altitude than nearly a thousand feet above the sea, except by Lough Acoose, which is 500 feet, and Lough Nambrackdarrig, 700 feet. Lough Caragh is its natural outlet, the upper part of which is narrow, and winds between hills, with often perpendicular cliffs, till it issues out on the low ground north of the mountains.

I have found from experience that visitors to the Lakes of Killarney have been satisfied, in nineteen cases out of twenty, with the romantic and fairy-like scenery of the neighbourhood of that enchanting spot, without wishing to explore the district immediately contiguous to it. There is no wonder in this, when there is so much to admire at Killarney, in whatever direction you may turn; for I must acknowledge that the views on the Lower Lake, Lough Leane, are truly magnificent and sublime. But there may be a tourist now and then, who has not absorbed the whole of his time in that fairy locality, and I am anxious to inform him that he may pass a week of great enjoyment, by a rapid tour through the districts or baronies of Iveragh and Dunkerron. My observations, therefore, will be confined to the less frequented western district of the county, including the island of Valencia, a spot celebrated in science during the last twenty years, as being the adopted locality, on several occasions, for the performance of scientific experiments of high national importance, a brief outline of which will be given subsequently.

Without further preface, therefore, I may state that, in company with a friend, I left our comfortable quarters in Killarney early one morning in the second week of June, 1862, by Her Majesty's Royal Mail, for the town of Caherciveen. The rain was falling, and pretty sharply too, but by this time, for it was an exceptional season of wet, we were tolerably used to it. The mail, it must be noted, is not carried into the barony of Iveragh by railway farther than Killarney; in fact, unless the harbour of Valencia becomes, which I hope it will, a port of communication between Ireland and America, I fear that there is little prospect that the engine-whistle will be heard for many years to come amongst the mountains and valleys of this thinly populated district. Nor are the letters and newspapers conveyed in carriages bearing any resemblance to our English mail-coach, which some of us can remember so well as forming a pleasing daily characteristic feature amidst the

habitual dulness of the country town where our youthful days were spent; but by a truly genuine Irish Bianconi car, constructed to carry nine outside, and none in. By the by, these Bianconi cars, which, a few years ago, were the only means of regular public conveyance in Ireland, are gradually disappearing, as our old mail-coaches have done before them. The gradual extension of railway to all the principal towns, has already banished this national vehicle from most of the old roads in the country.

Between Killarney and Killorglin, a distance of about thirteen miles, magnificent views are sure to attract the traveller, in whichever way his eye is directed. A short way to our right, two miles from Killarney, what remains of the ancient city of Aghadoc can be seen. Very little, however, is visible of a town which was probably a place of note at some distant age. The bishoprics of Ardferd and Aghadoc were incorporated before the year 1663, when they were united to the see of Limerick. The only remains now to be found near the site of the ancient town are a few ruined walls of the cathedral, and parts of an old castle and a round tower, most of which is said to have been erected about the ninth century.

My neighbour on the car, thinking that I was on the look-out for everything of note, suddenly cried out, "There is the Gap of Dunloe and the Macgillycuddy's Reeks behind us." We could not at that moment obtain a good view of this celebrated range, simply because we were on the wrong side of the car for that purpose. There is always this disadvantage in car travelling, unless one is fortunate enough to obtain the seat by the side of the driver. The loss of this view was of no great importance, as we had ample opportunities on a future occasion of admiring these reeks, whose lofty peaks are amongst the highest in Ireland. On the road our views were always changing; sometimes we were passing through avenues of trees, at others, skirting the base of a mountain, until we reached the town of Killorglin, up whose hilly street we were requested to walk. This place is situated near the mouth of the river Laune, which flows into Castlemaine Harbour. Killorglin is sometimes called Castle Conway, from a Captain Jenkin Conway, to whom these lands were granted by Queen Elizabeth. It is an ill-built place, but is well situated for trade, as vessels of 180 tons burden can reach the town, the river Laune being navigable to this point. The river is celebrated for the quantity of salmon annually caught in its waters, the fish being exported to Dublin, Cork, and other places. On one occasion I saw at the Killarney railway station, waiting for the goods train, nearly one hundred baskets of salmon, the whole of which came from the neighbourhood of Killorglin. Salmon are procured in large quantities from most of the rivers of Kerry, particularly from the river Caragh. They are also to be found in Lough Caragh. The population of Killorglin is about 600.

Leaving Killorglin, we passed over a comparatively uninteresting road, though the distant mountain scenery appeared as noble as ever, till we reached the river Caragh, which is spanned by a stone bridge, about midway between Lough Caragh and Rossbehy Creek. The Lake of Caragh, embosomed as it is within its mountain recesses, possesses great beauty. Ordinary tourists do not visit it so frequently as the beautiful scenery deserves; but disciples of old Isaak Walton have long since discovered that an abundance of fish can be obtained here, and also in the river which communicates with the sea. This lake is several miles in length, and is surrounded by some of the wildest scenery in the neighbourhood. The river Caragh signifies in Irish the stony or rocky river.

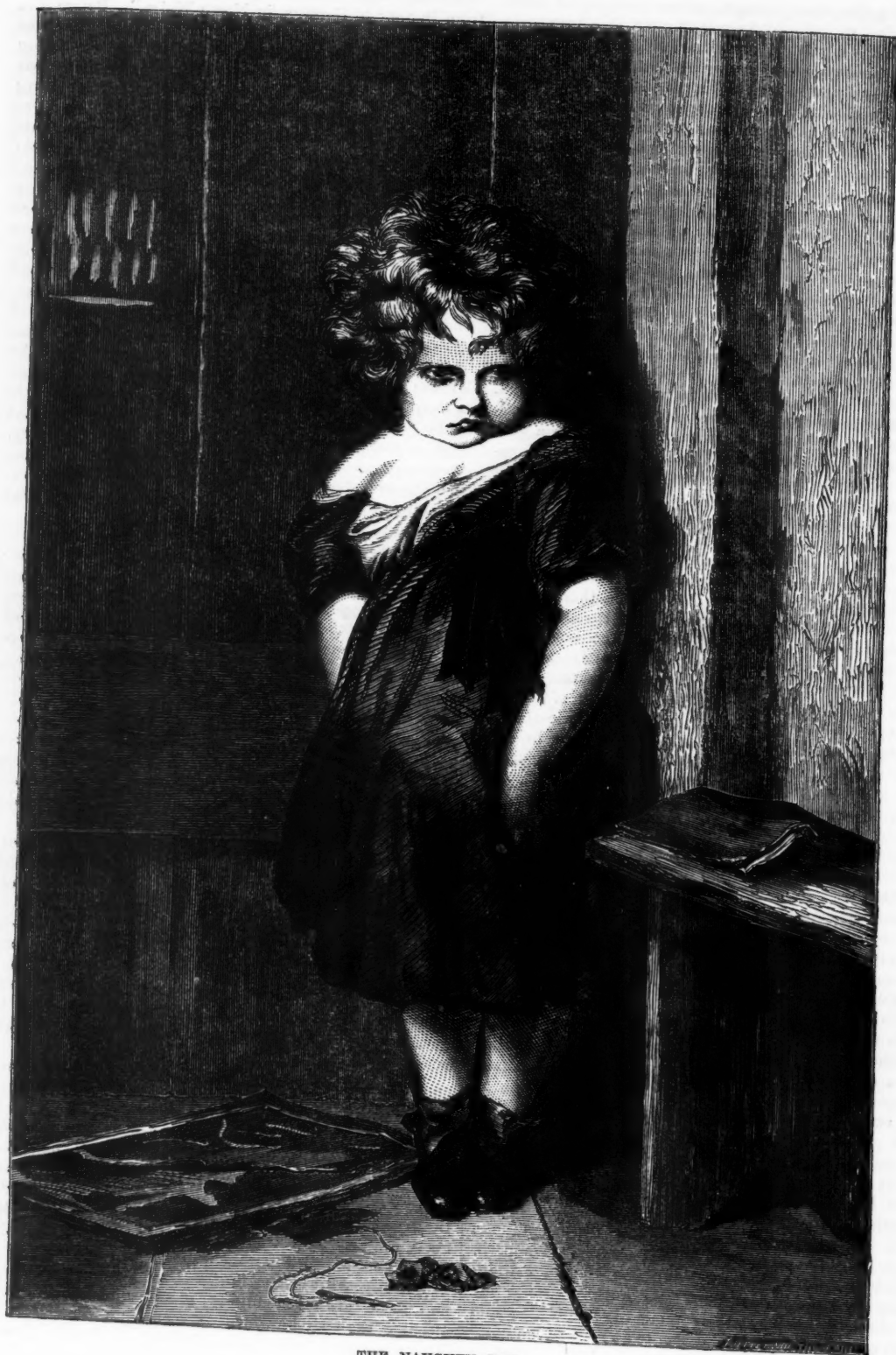
Crossing the river Caragh, before arriving at Glanbehy Bridge, we stopped for refreshment at a very neat and comfortable-looking lonely road-side inn, where we found the head-quarters of a number of tourist anglers. Soon afterwards, we were skirting the foot of a mountain partly covered with trees, a novelty in that part of the country; for the nearer to the Atlantic, the fewer are the trees, until they vanish from the landscape altogether. The Headly property situated here has such a picturesque appearance as to look, in some respects, like an oasis in a desert; the comparatively cultivated fields form a pleasant contrast to the wild moorland through which this road passes. In general, a few patches of potato-ground scattered here and there, saturated with wet, were the only signs of agricultural produce which I saw; there appeared to be no attempt at drainage, and the only wonder to me was how the potatoes could be grown at all in such a sloppy soil. I was informed by a fellow traveller, who was a resident at Caherciveen, that very few are now grown to perfection, and that, since the commencement of the potato-blight, the cultivation of that truly national esculent has been to a very great extent discontinued. Cutting turf for fuel appeared to be the only means of employment for the poor, throughout the whole course of my journey.

Passing Glanbehy Bridge, the celebrated Drung Hill is before us, reaching to an altitude of 2104 feet. It would take a considerable amount of modern civil engineering to form an easy road over this mountain. The engineer of forty years ago must not, therefore, be despised for the construction of a most excellent roadway, which encircles the mountain on the north side, about two hundred feet above the waters of Dingle Bay. This is indeed a most enchanting and romantic place; the road entwining itself around the sides of a precipitous hill, covered with heather from the base to the summit; while a dwarf wall, of a few feet in height, seems, in case of accident, the only protection from rolling into the sea. Before us lay the beautiful bay of Dingle, of a most exquisite blue colour, and without a ripple, extending seven miles in a direct line from shore to shore, having as a background the noble range of mountains on the Dingle peninsula. Only one thing was wanting to complete the scene, and then this splendid bay might rank in beauty with those most celebrated. I allude to the total absence of all kinds of shipping. Were the view relieved by a few passing ships, or even pleasure-boats, what a glorious prospect it would then be. A contributor to the "Oxford and Cambridge Review" notices the magnificent and romantic views on this road in words which, without any hesitation, I can indorse:—"The road skirts the coast, and exceeds in wild beauty any coast-road it was ever my good fortune to travel. The mountains, some of them two thousand feet high, are covered with heather, which grows down to the very water-side, so that seaweed and heather, sheep and seagulls, are all mixed together; while the road winds along quite over the water at the height of two or three hundred feet, round and through picturesque rocks, in a fashion that constrains you to admire the inventive boldness of the engineer. I agree with all Inglis says of this road; it is superb, magnificent, wonderful—anything you like to call it; and perhaps the brown desolation of the country you pass through previously, brings out the blue waves and beelling crags and purple heather to no little advantage." The traveller Inglis, quoted above, who made a tour in Ireland in 1834, says of this road, "In the magnificence of its mountain and sea views, it is little inferior to any of the celebrated roads along the shores of the Medi-

terranean, and is in every way superior to the road from Bangor to Conway, in North Wales." Before this road was constructed, the pass over the Drung Hill was extremely difficult and dangerous, the pathway being very stony and insecure. The passage of vehicles was impossible, agricultural produce and other articles being conveyed to and fro on horseback. In old times there was a curious custom among the people, to expect that every person who passed over the mountain should compose some verses to its honour; it being supposed that whoever attempted to pass without first exercising his poetical powers, would be certain to meet with some accident. Doubtless it would require, even now, more than ordinary care for a practised equestrian to ride over some of these Irish mountains; but what the Muses had to do with Drung Hill, I have not been able to discover. Smith, the historian of the county of Kerry, writing of this custom more than a hundred years ago, says that he had seen some of these effusions consecrated to the Muses; "but all the verses that I heard, were almost as rugged and uncouth as the road on which they were made." The new road through this district, which has done so much for the improvement of western Kerry, was constructed about the year 1820, by Mr. Nimmo, an engineer who has been instrumental, by similar undertakings, in improving in no small degree the social condition of many parts of Ireland.

The road retires at length into a valley; but little or no cultivation is visible. The moorland becomes wilder and wilder with every mile of our journey. The people about here appeared much in the same condition, if we may judge by the half-naked children visible in every direction. Numbers of these specimens of young Ireland were continually following the car, performing antics which reminded me of the City Arab, who on some occasions, for the chance of a halfpenny, will walk before you in the streets of London on his hands instead of his feet, throwing in a somersault now and then for your amusement. But to see these Irish children, from nine to twelve years of age, undergo such an amount of fatigue certainly surprised me. One little girl in particular, of about ten years of age, with only a small piece of blanket for a covering, followed the car, which was going at full speed, at least two miles, and when at last we threw her a penny, she turned suddenly and ran back, without any apparent loss of strength. I have been informed that the parents of these children encourage them in this unsatisfactory way of obtaining money, rather than send them to the national school. To say the least, however, this attendance on the cars is a source of great annoyance to travellers whose business compels them to pass over this road frequently.

The remainder of the road to Caherciveen varies but little from that which I have already described, except that it lies more inland, being separated from Dingle Bay by a noble range of mountains, which extend to the Atlantic Ocean. Mountains of considerable elevation are also to be seen on the left hand side of the road, going westward; for instance: Been Hill (2199 feet), Beenmore (2053 feet), and Beentee (1245 feet), besides many others. The highest point of the range at the right hand, is called Knocknadober, with an altitude of 2266 feet. All these mountains have a very noble effect, and some are even highly picturesque, particularly Beentee, the apex of which, as seen from the island of Valencia, has a decided conical shape; and when viewed on a clear sunlight day, I know of no mountain of its size so interesting in appearance. Caherciveen lies in the valley, at the northern base of Beentee.



THE NAUGHTY BOY.
From the painting by Thomas Landseer.

MEN I HAVE KNOWN.

THOMAS CUBITT.

THEOPHRASTUS has a curious treatise, in which he traces the resemblance of certain human beings to various animals; and we have all seen, and see around us every day, persons of whom we are prone to say, "He is like a lion," or "How got he that goose-look?" or "He is the image of an ape." In our days such speculations may not to every one seem wholly idle; for do not Mr. Darwin and Professor Huxley affirm that man is only a development from lower simial species, effected in the long lapse of ages? But the ancient philosopher spoke merely of resemblances, not of affinities. And certainly we do see in many persons traits of character, if not of appearance, which suggest these resemblances.

Now, though Thomas Cubitt, and his countenance, could not be compared to any of these lower types of creation, yet, following the odd analogy, he was born a Bee. And the analogy holds good in various ways. There was a quiet, humming way about him; and at his busiest, with an overwhelming amount of business to do, he seemed to be moving about without effort or hurry, from sweet to sweet, to fulfil his work and store his hive. You might almost fancy he was an idle personage, and *festina lente*—make haste slowly—his inexorable motto. But his beehood was most strongly exemplified in his admirable constructiveness. Mr. Charles Willich, the able actuary of the University Life Assurance Society, and a first-rate mathematician and geometrician, has demonstrated, in a capital essay, that the cells of bees are formed upon principles which evince the perfection of capacity for depositing the largest quantities in the most scientific forms. And the same might be shown of Thomas Cubitt's thousands of buildings of every order and description. The wonderful works of the bees were equalled in applicability to their purposes, and far excelled in variety—hardly two or three of the human cells being alike, and every difference leading to some corresponding improvement.

And then the genuine simplicity of mind and manner. One day I happened to translate some classical or foreign language, and he expressed his regret that his talent for such acquisition had not been cultivated. I remarked, that I wished, instead, that I could build a house as he could; and his only reply was, "Well, I ought to be contented. I believe I have never built a house without giving satisfaction; and I am sure I never disposed of one without doing my utmost to render it safe and eligible to its purchaser, or comfortable and agreeable to its tenant." This was the fair and true course to amass a large fortune. One never heard a complaint against Thomas Cubitt; and, what was stranger still, though he was most prosperous throughout his life, no one appeared to envy or malign him, as is so generally the case with successful individuals.

He was more taciturn than talkative; but his talk was the pith of sound sense, and its mode of utterance so modest, that hearers would hardly imagine the depths of the oracles to which they were listening. Prince Albert, Lord Truro, and other persons, the most competent to form a judgment, duly appreciated his lucid demonstrations of architectural fitness, and the arrangement of all the complications which practical convenience or symmetry demand for every part of a design. His complete mastery alike of the comprehensive whole, and the minute details, appeared to be merely natural—an instinctive endowment—not the fruit of laborious study and immense experience. And his resources were inexhaustible. He could discern capabilities where less

gifted observers could see only insuperable difficulties. Thus he built large towns on tracks of ground which seemed to defy utility; and vast and healthy populations were settled on localities which lay apparently in a condition of desert impervious to reclamation. Look, now, and view these large areas covered with noble mansions, handsome squares and fine streets, inhabited by high rank and thriving commerce—centres of fashion, busy life, industry, and wealth. The talent of one man has thus wonderfully altered the face of, and enlarged and improved the greatest city in the world.

I once enjoyed the treat of a two or three days' *tête-à-tête* sojourn with him at Denbies, his seat in Surrey, just at the time he had finished the handsome new residence there, and was preparing to go into it. The opportunity was very interesting to me, and made a lasting impression. His explanations of the plans, and the marvellous adaptation of commodiousness to every particular branch—the whole combined and working like clockwork—struck me as the perfection of the builder's art. Answer, O my reader, if you happen to dwell in a rather ordinary London lodging, what would you think of, and how would you enjoy windows that opened lightly, doors that shut noiselessly, locks and hinges that turned quietly, blinds that acted easily, fireplaces that could not smoke, waters (hard, soft, cold, hot) ever ready for every possible use, warmth to regulate at pleasure, and ventilation pure and thorough—I repeat, O reader, would not you deem these achievements of skilful building blessings for which to be thankful all day and all night, whilst you felt them all around you, without knowing whence they sprang or how they came? Massed in this manner, comforts are luxuries. Not five per cent. of even the upper ten thousand are aware of the contrast producible at the same cost, by work well or ill done. The generality of independent people can only appreciate these domestic comforts in a limited degree, and they are unknown to "the millions." And what do I mean by writing about them? It is simply to point the lesson that comforts are in the end cheaper than discomforts; and that it needs but honest contractors to fulfil their specifications, and well-directed moderate ability in the builders, to render the habitations of every class of the community vastly more salubrious and enjoyable than they now are. Follow the example I have set before you. Be just, and fear not; be skilful, and much happiness will attend your works.

The Denbies, independently of its comfort as a modern dwelling, was a remarkable place. The old house was long the residence of the former county member, Mr. Denison, as the new house is for the new county member, Mr. George Cubitt. There was an interpolation of Lord Albert Conyngham, afterwards Lord Londesborough, of good literary and archaeological repute; and of Mr. Jonathan Tyers, the quondam proprietor of Vauxhall Gardens, and a very curious character in his way. Every one has heard something of Vauxhall in former days, with its shady groves and trim alleys, its glittering lamps and brilliant fire-works, its slim sandwiches and "rack" punch, its rope-dancing, its music, and varied entertainments for the votaries of pleasure. Well, the head of this scene of revel was himself a gloomy ascetic anchorite. The beautiful heights of Denbies, vying with Mr. Grisell's Norbury Park, were disfigured to be the anti-type of Vauxhall. Instead of a promenade to look down upon Dorking and the charming landscape, there was a lonely walk, but not for lovers, terminated by skulls and cross-bones, and other paraphernalia of the undertaker's gloomy craft. There were inscriptions inculcating the vanity of human life—a solemn protest, as it were, against the

very existence of such a place as Vauxhall; and hither the morbid man bent his lonely steps, for days and seasons feeding his spirit with viands thinner than the sandwiches and weaker than the "rack" at his other establishment, whilst all the while a wretched misanthropist, pale

"Melancholy marked him for its own!"

I hope I may take credit for the suggestion; but my host, who had endured this in his customary quiet manner, required only a hint to rid himself of the monstrous incongruity, make a clean sweep of the abomination, and bury the bones.

I have been informed that Mr. Thomas Cubitt realized the largest fortune ever accumulated, even in his very profitable line of business. It is something to be told of the beginnings of such vast affluence, and there is no privacy to be hurt by briefly condensing the story of his own rise as given me in one of our conversations by this most worthy man. At first there was the usual struggle between limited means and aspiring emulation. By degrees, assiduity and enterprise won their way, and some progress was made. By good management and deservedly high credit, the necessary funds were obtained, but (as must be expected) at considerable cost for interest, so as to eat far into and much diminish the beneficial returns. This was not to be endured any longer than could be helped. At last, however, there was so important an amount of structure above ground and tangible, though heavily burdened by the loans alluded to, that the builder pondered how he might devise a remedy, and extricate himself from the oppression on his shoulders, and get on more freely with his accumulating undertakings. What has since become a very common practice, was at that period little known and rarely resorted to. It was to borrow money on fair legal terms, and sufficient security, from an insurance office. Mr. Cubitt turned his mind to the subject, showed the certainty of his substance, and obtained from one of these establishments the amount he wanted. Every incumbrance was immediately paid off, and the saving speedily amounted to some thousands of pounds a year. From that hour he never knew what required a pecuniary care; his straightforward path lay open before him, there was no obstacle, and he had but to go on and prosper, which he did to an extent, I believe, absolutely so vast, that he himself could not, or never tried, to calculate it. But however vast, it is very satisfactory to hear, as I have learnt, that it is as worthily inherited as it was worthily earned.

In private and social life Mr. Cubitt was an excellent companion. For the former, he had the rich store of intelligence, especially on his own peculiar subjects, of which I have spoken. For the latter, he possessed the grand essential quality of being a good listener. It is impossible for me to imagine him interrupting even a prolix twaddler; and as for those who had really anything to tell which merited hearing, he was all that the most exigent talker could desire. His private charity was great, and on the whole, I could not but look upon him as another Man of Ross upon a gigantic scale. He was universally esteemed. In him the world beheld a wise man, and his reward throughout his entire course was to find that wisdom's ways were ways of pleasantness, and all her paths were peace. He died in ripe old age, and was sincerely lamented by a widely extended circle of rich and poor.

A VISIT TO THE KONSANIE TEA PLANTATION.

PASSING through what has been called "the desolate valley of Byjnath," but which is now abundantly cul-

tivated, we came upon the ancient and picturesque town from which it derives its name. It stands on a bend of the river, and consists for the most part of the temples and houses of the Gosanis, relics of the piety of the Kootoor raj. We counted and examined about twelve of these ancient structures, containing numerous idols, better sculptured than are usually to be met with. The Gosanis, or priests, are supported by some endowments of very ancient date.

North-west from Byjnath, on the Almora Road, is situated the plantation of Konsanie, which I am about to describe.

The scenery of this road to the top of the hill, though not wild or grand, is very beautiful, with undulating hills covered with the fir pine. There are large spaces of level ground cultivated by zemindars, abundance of water, and a deep loamy soil, that would grow almost anything. Over the streams neat bridges are thrown, and the ride along its whole extent had rather the appearance of some well-cared-for estate in Scotland or Wales, than of a forest tract of country, in the heart of Kumaon. After a long and wearisome ascent, during which the darkness overtook us, and we with difficulty found our way to the hospitable bungalow of the manager of the plantation, we reached our haven and rested for the night. The next morning the songs of birds, the fragrance of flowers, the cackle of the farmyard, the voices of labourers going to their daily toil, and the rosy rays of the sun, called us to go forth, and reminded us of a summer morning in Old England.

Entering into the verandah, a view met our eye which it is impossible to exaggerate, and equally impossible to forget. The garden round the bungalow was laid out with close-cut grass and flower-beds. Snow-drops, roses, honeysuckle, fuschias, geraniums, and all the flowers one is accustomed to see in England, graced and perfumed the scene; and good gravel walks, creepers, arbours, and strawberry-beds aided the delusion.

Around, as far as the eye could see down a slight descent, were the tea-plants, the ground on which they grow being free from every weed, as the fresh and vigorous character of the shrubs showed. Two hundred acres are thus under cultivation, the plants all looking well at different periods of their growth. The whole estate consists of more than two thousand acres of the most excellent land, having in some places a depth of twenty feet of soil, with good aspect and proper elevation. Much of the remaining waste land is now being cleared, and the whole estate bears the marks of great care, energy, and skill, and is by far the most promising that I have seen in Kumaon.

In the neighbourhood of Konsanie, but at a much lower elevation, are the tea plantations of Jatola, belonging to the Government, and several other small private concerns; but this of Konsanie is the most highly cultivated, and the most extensive in Kumaon.

Looking beyond the tea plantations, clouds covered up the rest of the hills, and the valley of Byjnath; but above, towering in all their grand proportions and with their outline marked against the clear blue of heaven, rose the everlasting snows, looking as if seated on the clouds. Crest after crest of the mountains caught the rays of the rising sun, which tinted them first with a golden, then with a crimson light, till the whole range, to an extent greater than I have seen elsewhere, was one vast panoramic spectacle of dazzling splendour. Soon, however, this scene was changed. As the sun rose, the clouds from the valley cleared away, showing us the fertile fields of Byjnath, and the well-wooded undulating woods of the Kootoor valley.

Returning from a walk round the plantation, and an inspection of the factory and godowns, where all were earnestly busy at their work, the cheerful noises of the farmyard attracted our attention, and again reminded us of our English home.

And now let me state what my views are as to tea-growing. After a careful consideration of all the facts that have been brought to my notice, I do not pretend to be very wise on such matters, but I believe that the opinion I have formed has the sanction of many more experienced persons. As there are many persons very sanguine about the success of tea plantations, and some are just about to rush into the business without fairly considering the risks, a few hints on the subject may not be out of place.

It is quite true that the Government terms are most liberal, and that every encouragement is given to the cultivator, while the free life and the delightful climate lend their attractions to a planter's choice. But we must be a little practical, and look at the matter on all sides. You can get two hundred, or four hundred, or one thousand acres free of rent for six years, and a moderate assessment on three-fourths of the cultivated estate, till it reaches one rupee per acre; so that the final demand of Government upon you for an estate of one thousand acres would be only seven hundred and fifty rupees.

But in the first place, I believe it is useless to enter into such an undertaking with any capital less than 20,000 rupees (£2000), if you wish to have any sort of a return; in the next place, you need look for no return for seven years as interest upon your outlay; and in the last place, when your plants are in full produce, and you can manufacture good tea, you have then to consider where you can get a market.

The Konsanie tea plantation commenced in 1857, and, costing nearly 100,000 rupees, yielded this year not quite 6000 lbs. of tea, which, at Rs. 2 per lb., would be 12,000 rupees—not nearly the annual expense of working the concern. Next year it expects to double its yield, and so on every year, till in the seventh year it may pay 10 or 20 per cent. to the shareholders, if they can sell the tea.

It has been proved that good tea can be made; but who will buy it when all these plantations are in working order, in sufficient quantities to make it pay? In other words, where is the market?

Here the question is simple, and divides itself into two considerations. The market must either be found in the Himalaya or north-west provinces generally, or at home. First, will it be found at home? Here it must be observed, that the Assam tea-planters have got the ear of the market, and a name, and have, besides, the whole sea-board for their conveyance; so that they can in price beat the Chinese or any other tea-growers, and their tea is first-rate. I take it for granted, then, that the Kumaon teas, with so long and expensive a land-carriage, can never compete with the China or Assam teas in the home market, unless they should get a name for great superiority of flavour, and sell as a great delicacy at high prices. This, however, I doubt.

Now comes the other side of the question. Can they obtain a market in the north-west, either among the natives or the Europeans? It is already found that the number of European customers in the north-west is too small to consume the tea already produced. One thing should be mentioned: before the Government put a price of two rupees upon all teas indifferently, save the coarse Bohea, the planters realized at auctions from the natives large prices, as high as seven for the

best green teas. Since the Government have fixed this price of two rupees, the auctions have utterly failed. The market is spoiled!

And this brings me to speak of the only chance which I see for tea. The market must be found on the spot among the natives; on all sides the natives are beginning to like and to buy tea; you may often see a fat old Bunnia relishing his dish of the fragrant beverage. The zemindars of Oude, Rohilcund, and the Punjab like it; there is a market large enough among the native community, but they won't buy till you manufacture at a price which they can afford to give. In England tea can be had at two shillings and fourpence per pound, or one rupee and one and a half anna. The natives will buy fast enough where you can make it at eight or twelve annas per pound. If this can be done—and I believe it can and will be done in time, on large estates—tea will pay, and not till then. There is another thing. The Bhooteas would buy it extensively, and trade with it to Tartary, if it were cheaper and less bulky. For the brick tea of China, they sometimes give as much as Rs. 7 a pound. Cannot some way be found of making brick tea in Kumaon? Tobacco mixed with molasses is easily made up into bricks; and it surely would not be difficult to find out some means of making the Kumaon teas more portable, and thus of selling them to the Bhooteas, who would trade with them largely at the markets (close to the tea planter's doors) of Bagesar and the other fairs held on the Himalaya. One other thing is necessary besides capital, care, and energy, to the success of a plantation, and that is machinery. The labour is at present most expensive, and a great part of it might be dispensed with by the use of good sifting machinery. There is plenty of water-power on the hills, and this might surely be turned to some account in some part of the operations. These views may be erroneous; but if they cause any intending speculator to inquire for himself before he enters into it, my end will have been gained.

THE INFLUENCE OF RAILWAY TRAVELLING ON HEALTH.

A LITTLE brochure* has lately been published, which goes far to charge upon the railway system of this country cerebral diseases, nervous affections, and spinal and visual weakness to an extent of which few but those of the medical profession can have had the least notion. It would appear from this little book, that medical men have often been asked whether they consider railway travelling prejudicial to health; it was found that "there had been gradually gaining on the public mind a suspicion of dangers from railway travelling, widely different from those apprehensions with which the thoughts of travellers were at first uneasily burdened;" and, in consequence of this state of feeling gaining ground, a medical commission was for some time engaged in an extensive inquiry, and the result is here set down.

As might be expected, however, the evidence, as well as the results arrived at, are sometimes very conflicting. From cases stated of two persons afflicted with the same disease, one is able to endure a long railway journey with ease: the other suffers so much from the same journey, that she does not recover for several days. A "leading physician" gives evidence that the season-ticket holders on the Brighton line "appeared to him to grow old with a rapidity which amazed him," and, on

* "The Influence of Railway Travelling on Health," reprinted from "The Lancet," Hardwicke, London.

account of his observations, had discountenanced daily railway journeys as much as possible. And yet, the commission appear to have ignored altogether the class of commercial travellers, who as a rule travel more, and are healthier and longer lived, than their predecessors who went their journey in coach or gig. In the course of the inquiry, the case of the travelling *employés* of the Post Office is frequently adduced; and it would be impossible to obtain better or more conclusive evidence on the subject than that which is here afforded. Hundreds of Post Office officials are making long railway journeys almost daily in post offices fitted up like railway saloon carriages, where the work of sorting letters is performed previous to the arrival of the train at the different stations. The result of the inquiry made in this department establishes the fact of a positive benefit to be derived from railway travelling, by persons in the enjoyment of good health. The Postmaster-General in his ninth Report, the last issued (May, 1863), states that the sickness and mortality among the travelling officers is certainly not greater than that among the officers of stationary post offices. Dr. Waller Lewis, the medical officer on the establishment, supplies us with a number of cases which have come under his immediate notice, where incessant, and in fact excessive travelling, does not seem to have been at all prejudicial to the health of those so engaged. "One of our best officers," says Dr. Lewis, "states that he has no doubt that during the period of twenty years that he has been engaged in railway duties, he travelled on an average a hundred miles a day. All this time, he not only enjoyed most excellent health, but he was stouter and stronger than he has been since leaving that duty." Dr. Lewis sums up the conclusions to which his experience in the matter has led him as follows, viz. :—

1. Railway travelling has little, if any, injurious effect on healthy, strong, well-built persons, if the amount be not excessive, and if they take moderate care of themselves.

2. Persons who take to habitual railway travelling after the age of twenty-five or thirty, are more easily affected than those who begin earlier.

3. Weak, tall, loosely-knit persons, and those suffering under various affections, more especially of the head, heart, and lungs, are very unsuited for habitual railway travelling.

Mr. Whyte Cooper says, that daily experience convinces him "of the injurious consequences to the *eyesight* in railway travelling, in the strong inducements to read during the journey." Another physician considers it "very injurious to allow the eyes to rest on external objects near at hand, such as telegraph poles or wires, near trees or hedges, etc., whilst the train is in motion." Here, again, the case of the "flying post" officers may be adduced to settle the matter. Dr. Lewis does not find that among these officers "much mischief is occasioned to the eyesight."

Dr. Angus Smith (pp. 30-32) gives the result of experiments made on the temperature of railway carriages. A closely-packed third-class carriage showed a very small amount of pure air indeed, and in the number of cubic inches exactly corresponded with the amount which his own laboratory exhibited "when the strong smell of a sewer entered it." Third-class carriages are of course the worst in respect of fresh air; but "in very hot weather the woollen coverings of first-class carriages are hurtful."

Many suggestions of great practical importance are made in this little book; and notwithstanding the doubts and difficulties which are left unsolved, the facts stated

cannot fail to make it most useful to all habitual travellers. Railways, we are told, especially lead to excitement; they induce mental disorders; and when a passenger, by late or hurried arrival, is over-heated, he is apt to indulge in open windows, "which, however pleasant," says Dr. C. B. J. Williams (pages 33-5) in his valuable evidence, "induce catarrhal affections of the respiratory organs, sore throats, headaches, toothache, and particularly, amongst various forms of rheumatism, lumbago and sciatica." "Many serious and fatal cases of pulmonary disease have dated their origin from colds caught in a railway carriage." The plurality of English folk love fresh air, and have a horror of closed windows; they prefer being chilled to the notion of being suffocated. Foreigners on the continent, on the contrary, even with slower trains, commonly go to the opposite extreme. The best way, as a rule, adds Dr. Williams, is to keep the windows shut when the train is in motion; open, when standing at the different stations. In cold weather, when travelling quickly through the air, the passenger stands in much more risk of chill from open windows, than of any hurt from closed ones. Each carriage is furnished with ventilators (or should be), which are generally sufficient to keep the air fresh. "When the outer temperature is above 40°, and the carriage is full, an inch or two of one or both the windows open may be permitted with safety. In fast trains, with the outer temperature below 40° Fahr., there is circulation sufficient to keep the air pure, with even six or eight passengers, without any windows open. It is surprising how small an aperture suffices for ventilation and free circulation of air when the train is in rapid motion."

Undoubtedly the most serious evil in the relation of railway travelling to health is in its effects on the muscular system, and its influence on the cerebral and spinal centres. "The immediate effects of being placed in a vehicle, subjected to rapid, short vibrations and oscillations, is that a considerable number of muscles are called into action, and maintained in a condition of alternating contractile effort throughout the whole journey. The more violent movements of the carriage call into action the various sets of muscles in the back and chest; and it is only by an incessantly varying play of muscular contraction and relaxation that the body is preserved in a tolerable state of equilibrium, and that the passenger combats with success the tendency to be shaken into a most unpleasant variety of shapes and positions." The frequency, rapidity, and peculiar abruptness of the motion of the railway carriage, are thus said on all hands to keep up a constant strain on the muscles; and to this must be ascribed a part of that sense of bodily fatigue, almost amounting to soreness, which is felt after a long journey. With regard to the effect of these influences on the brain or spine, *in the milder form*, "they lead up to diseases which, remaining for a long time latent, may still ultimately end in paralysis;" whilst these concussions occurring in a *serious and marked degree*, tend, according to Dr. Forbes Winslow, to annihilate the functions of these organs. In railway travelling something like 20,000 slight concussions per hour are experienced, and, as the result of these joltings or concussions are more or less disagreeable and dangerous, recommendations are made in the book for reducing the unpleasant effect on the sensations experienced. The great remedy is, of course, elasticity. The stuffing of *first-class* carriages is a recognition of the principle. The well-padded and springy seats of these carriages do much to obviate the mischief of these concussions, for those who can afford to travel by them; while on the other hand, *third-class* passengers, who are con-

demned to hard boards, which transmit without mitigation the shocks of which we are speaking, are compelled to submit to one acknowledged source of evil influence on health. Therefore, when we find that of all classes of passengers third-class travellers form above 60 per cent. of the whole number, it becomes a matter of simple justice, that, under the above circumstances, railway companies should to some extent alter their inhuman arrangements, and begin to consider more the health and comfort of this increasing and important class of travellers. Reverting, however, to existing arrangements, elastic cushions for the seat, and caoutchouc or honeycomb mats for the feet, are highly spoken of as likely to lessen the inconvenience occasioned by the oscillation of the carriages. Dr. Williams states, that especially for weak persons or invalids, a small horse-shoe air-cushion round the neck of the traveller, and another of large size around the loins, will wonderfully intercept the noise and the jarring motion of the carriage.

To sum up all, we think we gather from the investigation, that *healthy* persons receive a positive benefit from the stimulus given to the circulation, the respiratory organs, and to muscular activity by a railway journey; while to the *weak* and unhealthy, or those unused to travel, the headaches, dizziness, and weariness of which we hear so much are only natural symptoms. The evils arising from the oscillation of the carriages, the hurry and excitement so often felt before getting into the train, and the risks from cold afterwards, may be said to be the chief perils to which the railway traveller is liable. The dust and smoke, the grinding, rattling, whistling, are the prices we pay for the gain in time and all the other advantages that the railway system affords. And really, when we come to think how many of the same, or perhaps worse, inconveniences we should have to encounter, with the loss in time, were we to choose some other mode of conveyance, we can scarcely judge the bargain a bad one or the price too dear.

IMPOSSIBLE THINGS.

Long before the process was discovered of depositing layers of gold and silver upon surfaces of copper, and other base metals, by electrical agency, a method was devised for accomplishing that end by an operation different from any which had been previously adopted, and which apparently violated some chemical laws. I happened to be present in the office of a celebrated patent agent, when the inventor was taking the steps necessary for securing his discovery by letters patent. I will relate what took place, because it led to a discussion about the accomplishment of things which people said could not be accomplished, thus furnishing me at once with my examples, and a title for this paper, which I accordingly head with the suggestive words, "Impossible Things."

My friend, the patent agent—Cogwheel let us call him—has no hobbies; no strong predilection for this, that, or the other thing, no pet theories which he rides into the domains of error, as some great philosophers whom I could mention are wont to do. Not that he objects to theory in the abstract, or theoretical men, but he insists that every new proposition said to be possible, shall have been proved before he will stir a step in getting Her Majesty or Lord Chancellor to grant in behalf of it impositions of the big seals. But in this is Cogwheel's peculiarity:—Once let him see with his own sharp eyes that a thing can be done, and he will believe in the pos-

sibility of doing it, all the theory of the philosophers notwithstanding. He is peculiar, too, in drawing a distinction between "things impossible" and "things impracticable." Hair-splitting, did I hear you say? No. Between the two there is a difference, as Cogwheel shall make apparent, if you come with me to his office.

There he sits nursing his foot, carelessly thrown across his knee. He is laughing cheerily; but four gentlemen present with him are in no such laughing humour. One of them is a rough-looking artizan, whose stained fingers proclaim to intelligent eyes that his avocation in some way or other involves the use of chemical bodies. The other three are better dressed: an air of conscious knowledge is visible in their demeanour, as they look, half pitying, half contemptuously, towards the fourth, who pants, and puffs, and turns red; whilst, now and then, he rises, paces the room, and emphasizes his words by sundry thumps and slaps upon the table, or against the wall.

"It's no good, gentlemen, to tell me the thing's impossible or unchemical. *I have done it, and that's enough.*"

The three thoughtful-looking gentlemen to whom this observation was addressed, were three of our most celebrated chemists. They exchanged glances of significant meaning, and shrugged their shoulders; but they made no remark, nor did Mr. Cogwheel.

Cogwheel is a polite man; though, in exercising his politeness, he never allows anybody to waste his time. He makes up his mind what time—to a minute—a disputant ought to have accorded for expressing the ground of his opinions. When the exact minute has come, and Cogwheel has elicited his "points," he finds some means of bringing the statement to a close. The aspirant for letters patent, on the occasion of my visit, had said that, certain things being taken, and certain directions followed, surfaces of base metal might be covered with gold. The triumvirate of celebrated chemists had been called in to certify to the competence of the process. They had discussed the matter, and, in the pride of their theory, they had pronounced it to be impossible; they affirmed as roundly as might be, without seeming rude, that the thing could not be done. On the other hand, the inventor no less roundly asserted that he had done it. Here, then, they were at issue, three to one on a matter of fact. Cogwheel saw that.

The pre-allotted time for discussion was up. He at once began to indicate that he must take on another case. The little foot encased in patent leather, so long and assiduously nursed on the lap, he planted upon the floor. The hint was not taken. He pulled out his watch and looked at the dial plate, with no better effect. Then addressing himself to the inventor, he spoke thus: "You say this *can* be done; and *you*, gentlemen," turning to the chemists, "that it is impossible. One question: Have you tried?" All three prepared to reply by good set speech. Cogwheel interrupted them: "Yes or no, gentlemen?" "No." "Then go and try; and when you *have* tried, come to me again. I have great experience in seeing the accomplishment of impossible things." The chemists went away, tried, and succeeded, thus furnishing one more example of so-called impossible things made possible.

Sitting alone with Cogwheel on an evening shortly after the event just narrated, our conversation happened to lead that way; we were imperceptibly drawn into certain reflections upon the mutual dependence of theory and practice, and the great advantage which would accrue to the world if a more cordial relationship were established between them. "It is not a little extraordi-

nary," he observed, "that not merely people in general, but the cream of population—thinking men of the world, philosophers, logicians—men whose education should train in the ways of sound evidence—still persist in attaching so much importance to that much-used word 'impossible.' When Napoleon said the word 'impossible' was not to be found in his vocabulary, the remark was taken to be no better than the empty boasting of a young hero, puffed up with early success; but I do not see that impossibilities need often exist for a general. Give him troops enough, sufficient provisions, ammunition, and choice of ground, there would be few impossibilities in his sense of the term. In the application of science to practical ends, it is otherwise. Achievements here are limited by the fixed and immutable laws which the Creator has impressed upon matter. These laws man can neither violate nor evade. Once clearly prove that a case involves the violation of a law of nature, and the inventor has no hope. It is the function of philosophers and philosophy, to discover and expound these laws. But see where the mischief lies—philosophers, in their endeavours to attain perfection, generalize on the laws of nature from insufficient data, and often feign impossibilities which do not exist. Well is it, therefore, that there are such persons as empirics; men equally ignorant of nature's laws and theories of philosophy; men who try, and try again, hopefully exploring, when the philosopher would have no hope. In this way, and by such men, truths are often unearthed, and made apparent.

"I have just remarked," continued Cogwheel, "that theorists are often at fault, because they do not truly interpret the laws of nature; but this is not the only source of their errors: they often commit mistakes in underrating the power of art to overcome obstacles. I do not know a more remarkable fallacy of the latter kind than one belonging to the history of the electric telegraph. In the year 1836, two celebrated British philosophers—one in a published treatise, the other in a lecture delivered before the members of the Royal Institution—proved, each to his own satisfaction, no less than to the satisfaction of many other people, that no form of electric or magnetic telegraph communication was practicable beyond a very inconsiderable distance. Well, there it was: $A+B-X$, and so forth, all in order, I assure you. The electric fluid could not (it was argued) be made effective for telegraphic purposes beyond a determinate and inconsiderable distance. What is the fact? What has time demonstrated? You and I now see."

"And what do philosophers say about it now?" I asked. "Have they found a graceful path of exit from the scrape?—have they let themselves down easily?"

"Oh, yes," said Cogwheel, "the philosophers have got out of the scrape gracefully enough. They were correct so far as their proposition went; but they did not foresee that propositions might be brought to the rescue. Were I to assert that one single horse-hair might be stretched between London and Manchester, you would perhaps think the horse which furnished that single hair must have had a long tail; but were I to assert that a horse-hair rope might be stretched between London and Manchester, you would simply reply, Of course. Well, the philosophers of 1836 simply asserted that no one charge of electric fluid could be sent along a wire to an indefinite distance, because some of the fluid must be inevitably lost during its onward course. Everybody knows that the philosophers of 1836, however, did not perceive that many lengths of electric current might be spliced together, like so many individual hairs in a horse-hair rope."

Cogwheel here drew a little key from his pocket; proceeding to a cupboard, he unlocked the door, and threw it open. Within I perceived a bright array of shining brass models. "I think," said Cogwheel, "I see here before me a model representation of every magnetic or electric telegraph which has ever been invented; and—"

"Oh, thank you, my dear Cogwheel," exclaimed I, with a sort of desperation; "don't trouble yourself to charm me with the particulars of so long a list: I only want an outline of principles. Pray allow me to get at what I want in my own way. I know they all require electricity to work them—the electric fluid, so to speak; but I don't know how various lengths of electricity can be spliced together after the fashion of the individual hairs of a horse's tail, in the structure of a horse-hair rope."

It was not a polite act of mine thus to stop my friend Cogwheel just as he was beginning a most elaborate lecture on telegraphs—past, present, and to come; but I knew how impossible it would have been to stop him, when out of business, had he once got under way. However, despite my interruption, he proceeded—

"Well, now, the case of electricity is just this. Granted that it does travel with enormous rapidity through conducting bodies—through copper wire with the velocity of at least 300,000 miles per second—it does not travel through every conductor with equal rapidity; yet practically much of it is lost in travelling, so that the energy of electricity, on which its telegraphic operation depends, becomes so inconsiderable at last, that it no longer suffices to work any form of telegraph. You appear so desirous to remain ignorant as to the distinctions between electric telegraphs, the difference between electric telegraphs properly so called, and magnetic telegraphs—between magneto-electric and electro-magnetic telegraphs—needle telegraphs and gold-leaf telegraphs—printing telegraphs of different kinds—stroke-printing and chemical stroke-printing telegraphs—type-printing telegraphs—bell-ringing telegraphs, and many others—that I shall merely say, in respect of each and every one of them, the transmission of electricity through a conducting body with a certain definite force is an inevitable postulate. The distance to which an electric current may be able to proceed, still having the required force, will depend upon many circumstances. Firstly, it will depend upon the strength of the current at its first setting out; secondly, on the conducting ability of the wire through which it passes; thirdly, on the amount of resistance to be overcome by the special telegraphic arrangement. Therefore, you perceive that, though the philosophers speaking in 1836 were rash in arriving at the conclusion that electric or electro-magnetic communication would be impossible beyond a certain distance, they were not rash in expressing the general truth that the transmission of electricity through a conducting wire is necessarily attended with diminution of original power, and is therefore subject to a limit."

"What, then," demanded I, "do you consider to be the practical limit, at this time, to the distance which electricity may travel, still retaining energy enough for telegraphic purposes?"

"On land, there is practically no limit," replied Cogwheel; "at sea, I cannot tell you."

"The fact is this," continued he: "when the original electric current feels itself so weak that it can neither work an escapement nor turn a magnetic needle, much less do the heavier work which falls to the lot of printing telegraphs, it may be strong enough to help itself to more electricity, due means being provided. The cur-

rent, being thus invigorated, may be made to do one of two things, according to circumstances: either to speed its way onward in further travel, again crying out for more when feelings of weakness come on; or, if desired, the invigorated current may be made to speak in telegraphic language at once. Thus, it really follows in practice that the electric power by which an electric telegraph is worked is developed, not by the sender of the message, but by the receiver. With oceanic telegraph conductors it is otherwise. You may as well talk about relays of post-horses in the ocean as relays of electric power. Whatever is accomplished must be accomplished by starting with electricity of force sufficient to overcome all obstacles, preventing its escape the best way you can. Gutta percha has done a great deal in the way of preventing the escape of electric power, and telegraphic combinations are set in motion with far greater ease than philosophers considered probable in 1836. Direct telegraphic communication admits, therefore, of being more readily accomplished than they thought; besides, if, say electricity—having traversed the broad Atlantic—arrives there jaded, tired, nearly worn out, still it is not bound to tell its telegraphic tale at once, as the philosophers of 1836 imagined. If it has any power at all—if there be one kick of vitality left—it may help itself to more power, and tell its tale afterwards. Strange to say, the helping itself to more is followed by immediate and never-failing inorganization.

The possibility of working an electric telegraph by a primary current of electricity transmitted through a distance of 2000 miles on land has been demonstrated by experiment, and ocean telegraph has also had its successful demonstrations.

"Well, after all," remarked I, "the philosophers were only a little wrong. Their general notion was correct; and as to the case of ocean telegraphic lines, little could they have anticipated the discovery of gutta percha. The genius of any individual, smaller in the ranks of science than Newton himself, might—"

Cogwheel interrupted me. "So you really do not think it possible," he remarked, "that Newton could have proclaimed a thing impossible that really was *not* impossible? Eh, would you say that?"

"It was my meaning," Cogwheel thereupon, without making any reply, went towards a cupboard, whence, removing a telescope, he placed it in my hands. "Look at the candle through that telescope," said he. I looked. "Do you see the candle in its own proper colours?"

"Yes, only larger."

"Never mind the size of it," said Cogwheel. "Is the candle surrounded by rainbow colours, or is it not?" I assured him it was not.

"Of course not," said Cogwheel. "You see the candle in its own proper colours, because my telescope is *achromatic*; yet Sir Isaac Newton went the length of affirming that it was hopeless to expect to make an *achromatic* telescope on the refracting principle. He did not employ the word impossible, but *hopeless* means nearly the same thing. What is the result? Why, that telescopes and microscopes are made achromatic, by what to us seems the most obvious application of optical principles."

"Not to go deeply into the matter," said I, "could you just give me an outline of the way by which the hopeless case, as Newton called it, was made hopeful?"

"Of course you are aware," replied he, "that white light is a mixture or compound of the three colours, red, yellow, and blue. Newton imagined there were seven primitive colours—not three; however, let that pass. Three or seven, the results are similar in the

present case. White light, then, is a mixture of three colours—red, yellow, and blue. They make white light so long as they travel in company, but if from any cause one colour should be separated or removed from the other, or if any two should be removed or strained away from the third, then the light, which was originally achromatic—that is to say, without colour, in other words, *white light*—would have become coloured, or chromatic. If white light be made to pass through a triangular prism of glass, or other transparent material, it is decomposed into the three primary colours, as you know."

"But there are no triangular prisms in a telescope," interrupted I.

"True," replied Cogwheel; "but take a lens—any lens. Look at its edge, and tell me whether that edge does not resemble a triangular prism wound round on itself in the form of a ring. When I say the edge of the lens, I do not mean to assert that any actual line of demarcation exists between the edge and the centre. If, however, we assume a practical line of division between the two to exist, mark this curious fact. There does not exist any kind of glass, or other transparent material out of which a lens can be made, that has not a predilection for twisting one of the primitive colours of white light away, and of course to a proportionate extent destroying original whiteness. But it so happens, though Newton was not aware of the fact, that different kinds of glass are endowed with different tendencies to bend aside or separate this, that, or the other colour of light. One kind will bend or refract blue light most, another red, and a third yellow light. Don't you perceive what comes of this? Suppose we manufacture a compound lens, made up of slices of different kinds of glass, each kind refracting its own particular light—does it not follow that rays of all three colours will be brought together, and original white light will be white light to the end? That's how the Newtonian impossibility was made possible. But why do I say the Newtonian impossibility?" he added. "That illustrious philosopher also considered it an impossible thing that light should consist of waves in vibration, as nearly all philosophers at the present time hold it to be. If light consist of waves, it ought to be capable of turning a corner, argued Newton."

"And surely it ought," said I.

"And so indeed it does," was the remark of Cogwheel; "the simplest proof of which is this: the centre of a shadow is always darker than the edges. This," continued he, "is the simplest demonstration; but I could mention, if I liked, a dozen others at least."

"Suppose we now add steam engines, and steam locomotion on land and water, to our list of impossible things made possible. Even Watt, the illustrious perfecter of the steam engine, doubted whether it could be made to work effectively on troubled water. And I suppose," continued he, "that you have heard of a certain philosopher who demonstrated by all the certainties of mathematics that steam ships could not cross the Atlantic. Then there was Davy—poor Sir Humphry, who, when examined before a committee of the House of Commons as to the practicability of gas-illumination, said it would be as easy to extract sunbeams from cucumbers by distillation. Wollaston, a philosopher of greater mathematical turn than Davy, did not think the project quite so hopeless. The two philosophers happening to meet one day, it is said, in St. Paul's Churchyard, they began to talk about gas-illumination. What the arguments of Wollaston might have been, I do not know; but Davy is stated to have so far modified his original opinion as to have remarked, 'Yes, when you

get the dome of St. Paul's for a gasometer you may have gas-illumination.' Poor Davy! if he could but have lived to see the enormous size of gasometers now.

"Apropos of Davy, another anecdote concerning him occurs to me. I will relate it, because it shows how falsely learned men sometimes reason on the consequences of their own discoveries. Davy proved, as every chemist is aware, that if electric power of a certain kind be transmitted through water, the latter separates into two gases, oxygen and hydrogen. It so happened that one morning Davy and Wollaston chancing to meet, Wollaston said, 'I wonder, Davy, whether if oxygen and hydrogen gases be taken in the necessary proportions to form water, and compressed into the exact space the corresponding amount of water should occupy, they would form water. It would be a good experiment,' Wollaston continued; but pausing a little, he said, 'and yet, on consideration, I am so convinced that water would not be generated, that I should hardly care to trouble myself with the experiment. 'And I,' replied Davy, 'should hardly care to give myself that trouble, being convinced in my own mind that water *would* result.' Now, the joke is, that Davy's previous investigations tended to Wollaston's conclusions.

"The impossible people, I repeat," continued my friend, "I mean the people who say this, that, and the other thing cannot be done, are generally led into error by their taking a too limited or restricted view of human resources. For my part, I know of no proposition that must necessarily be impossible except it be directly opposed to a law of nature. If the proposition were brought to me, to suspend the Monument six hundred feet high in the air, by a skein of sewing-silk, I should call that impossible, because the strength of a skein of sewing-silk is known within a trifle, and the weight of the Monument would be something more than enough to break it; but were the proposition that of suspending the Monument six hundred feet high, by some attractive force of magnetism, I should not call that impossible. Speaking as a practical man, I should designate it as impracticable, and people would know what I meant. By voltaic agency we can generate magnetic power of any force. I know, then, that by expending money sufficient, the Monument might, as Mahomet's coffin was said to be, be suspended by magnetic agency. We should have to envelope the 'tall bully,' as Pope calls him, in a strong iron cage, and erect a horse-shoe magnet of sufficient power over him. Stick to the horse-shoe magnet *he must*, and, raising the magnet, up the Monument must go. Smile if you like—the feat would not be impossible."

"Then," said I, "if magnetism be a force so powerful, why are engines moved by magnetism in place of steam placed in the list of impossible things?"

"They are not in that list," was Cogwheel's answer. "It is merely a question of expense. Steam is more economical than magnetism—that is all. Small pieces of mechanism are frequently moved by magnetic energy: need I mention telegraphs? I have seen a turning-lathe worked by magnetic force, but only as a curiosity; steam would have been more economical." Arrived thus far, Cogwheel slightly yawned, whereupon I asked him whether he had exhausted his list of impossible things made possible?

"To the end of it!" he exclaimed. "By no means; I could go on for a month."

"Pray don't trouble yourself to do that, my good fellow," I interposed. "Some day I shall be looking in on you again."

Varieties.

ANTIGUAN STAMPS.—In the article on "Rare and Curious Postage Stamps," in No. 605, the stamps of the Government of Antigua were by error stated to have been engraved by Waterlow and Son. They were executed by W. Houghton, 162, New Bond Street, London.

DUST STORM IN INDIA.—The following extract is from the letter of a medical officer in the Indian Army:—

"Hydrabad, Scinde, June 18, 1863. The weather is very hot and oppressive here. The thermometer in my hospital verandah stands at 115 deg., though in the room where I now write, which is artificially cooled by wet screens, the temperature is only 98 deg. The nights are but little cooler. Last night a man of the 95th regiment was killed by the heat, not of the sun, but of the atmosphere at night. We were visited the other day by a *dust storm*. It was a magnificent sight. The weather had been, as now, very hot and oppressive for some days. Towards noon a number of little clouds began to form all over the sky. By and by these little fleecy patches became larger and darker, especially in the north, which at four o'clock was as black as ink. All this time there was no wind, but about five the awful blackness was evidently approaching us; and just then the sky presented a very singular appearance. A streak of reddish black or purple ran between the horizon and the inky vault above. Watching this streak or band, we could see it enlarging and coming nearer, approaching so rapidly that very soon it was apparently within a mile of us. At this time it appeared like an enormous wall of red smoke stretching away for miles, and shooting up into great ruddy pillars, reaching from the earth far into the solid blackness of the sky, and twisting and twirling like water spouts. All our doors and windows being closed, we were watching it from the flat roof. Soon with a roar it was upon us. From broad daylight it became instantly as dark as night, and we were nearly choked with fine dust. Then came lightning, hail, and a perfect torrent of rain; and in an hour it was again fair weather. The wind not being high, the dust, which was prodigious in quantity and lifted up to a great height, seems to have been suspended by electrical action. Altogether it was one of the grandest sights I ever beheld.—E. N."

THE POWER OF TRUTH.—Though all the winds of doctrine were let loose to play upon the earth, so Truth be in the field we do injuriously, by licensing and prohibiting, to misdoit her strength. Let her and Falsehood grapple; who ever knew Truth put to the worst in a free and open encounter? Her confuting is the best and surest suppression. For who knows not that Truth is strong, next to the Almighty? She needs no policies, nor stratagems, nor licensings to make her victorious; these are the shifts and the defences that error uses against her power; give her but room, and do not bind her when she sleeps.—Milton.

ROTATION OF THE EARTH PROVED BY RIVER BANKS.—A new proof of the rotation and globular shape of the earth has been furnished by the result of extensive observations made in European and Asiatic Russia, on rivers which run either in a northerly or southerly direction. It is found that the bank, on the right of a voyager descending such rivers, suffers most from the attrition of the stream; so that the latter gradually recedes in the same direction, causing the phenomenon, previously recognised, though not accounted for by geologists, of the right banks of such rivers being generally steeper and higher, and the left flatter and more alluvial. These results are of course due to the varying velocities caused by the rotation of the earth, in parts near and remote from the equator. Thus, for instance, the water running north, retaining that velocity eastward which it possessed farther south, presses continually on the east or right bank, because, though the latter is moving in the same direction, it is with a less velocity. In the southern hemisphere the results would, of course, be reversed.

AN ARITHMETICAL WONDER.—If twelve persons were to agree to dine together every day, but never sit exactly in the same order round the table, it would take them thirteen millions of years, at the rate of one dinner a day, and they would have to eat more than 479 millions of dinners, before they could go through all the possible arrangements in which they could place themselves. A has only one change, A B two, A B C six, four letters 24, five 120, six 720, seven 5040, eight 40,320, nine 362,880, ten 3,628,800, eleven 39,916,800, twelve 479,001,600.